0.5 1) List all of the 80x86 eight bit registers. AL ,AH ,BL ,BH ,CL ,CH ,DL ,DH

0.5 2) List all the 80x86 general purpose 16 bit registers. AX ,BX ,CX ,DX

0.5 3) List all the 80x86 segment registers (those available on all processors). CS , DS ,SS ,ES

0.5 4) What is the function of a segment register in 8086? points at the beginning of a segment in memory.

5) Explain the concept of pipelining in 8086.useing diagrams?

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Non-Pipeline (8085 µp)

| fetch 1 | exec 1 | fetch 2 | exec 2 |

Pipeline (8086/8088 µp)

fetch 1	exec 1
fetch 2	exec 2
fetch 3	exec 3

6) Explain the concept of segmented memory?

1.5 Memory segmentation   means that the memory has been divided to number of blocks, where each address of theses four blocks stored in a four segment register

7) What physical address is represented by:

1   (i) 4370 : 561E H   ------------------→ 48D1EH
         (ii) 7A32 : 0028 H ------------------→ 7A348H

8)Describe the difference between the instructions: (i)   MOV AL, 0DB H (ii)   MOV AL,DB H

1   both instruction will produce the same result , only at some assembler
if we use second instruction you will
            get an error .

9) Explain the difference between the carry flag and the overflow flag.

1 In unsigned arithmetic, watch the carry flag to detect errors.
In unsigned arithmetic, the overflow flag tells you nothing interesting.

In signed arithmetic, watch the overflow flag to detect errors.
In signed arithmetic, the carry flag tells you nothing interesting.

10) When do you typically use the CBW and CWD instructions to sign extend a value?

1.5 Normally used at Signed Integer Division operation.
 IN, CASE of DIVIDE 16bit by 16 bit , or 8bit by 8bit , we have to extend the size of the divisor to be 32 bit or 16 bit .

11) What instruction(s) would you need to use to read the eight bit value at I/O address 378h?

1   MOV DX ,0378H
    IN AL , DX

12)Which flag(s) does the 80x86 use to test the following unsigned conditions? How must the flags be set for the condition to be true?

1.5 a) equal,   JE   XXXXX   ; CHECK ZF   , CONDITION IS TRUE IF ZF =1
b)less than , JB XXXXX   ; CHECK CF   , CONDTION IS TRUE IF CF = 1

0.5 c) greater than or equal. JAE XXXXX OR JNL XXXX ; CHECK CF , CONDITION IS TRUE IF CF= 0

0.5 13) What instruction is CMP most similar to? SIMILAR TO SUB

0.5 14) What instruction is TEST most similar to? SIMILAR TO AND

0.5 15) What does the NEG instruction do? TAKEING THE 2'S COMPLEMENT TO THE OPERAND

16) What is the difference between RCL and ROL?

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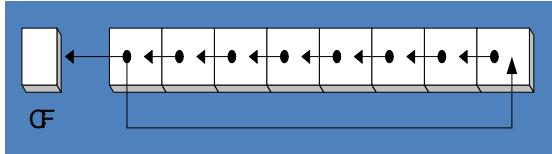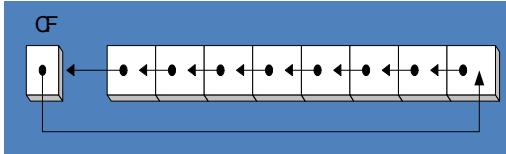
A- How could you use the TEST instruction (or a sequence of TEST instructions) to see if bits zero and four in the AL register are   both set to one?

2 TEST AL ,11H   ; 00010001
 JNZ XXXX ; CONDITION IS TRUE IF BIT ZERO AND FOUR ARE SET TO ONE .

B- How could you logically AND the value in AX by 0FFh using nothing more than a MOV instruction?

2 MOV AH , 00   ;   AND AX ,00FFH   , ie AH-→00 , AND AL → AL STAY THE SAME

C- Write a subroutine that will return the maximum 16-bit SIGNED integer from an array of

integers. On subroutine entry, register SI will point to the start of the array (each element is 16 bits), and register CX will have the number of integers in the array. The maximum value should be returned in the AX register.

```
        MOV AX ,8000H
 X :    CMP AX ,[SI]
        JG   NXT
        MOV AX , [SI]
NXT:    INC SI
        INC SI
        LOOP  X
```

---GOOD LUCK ---